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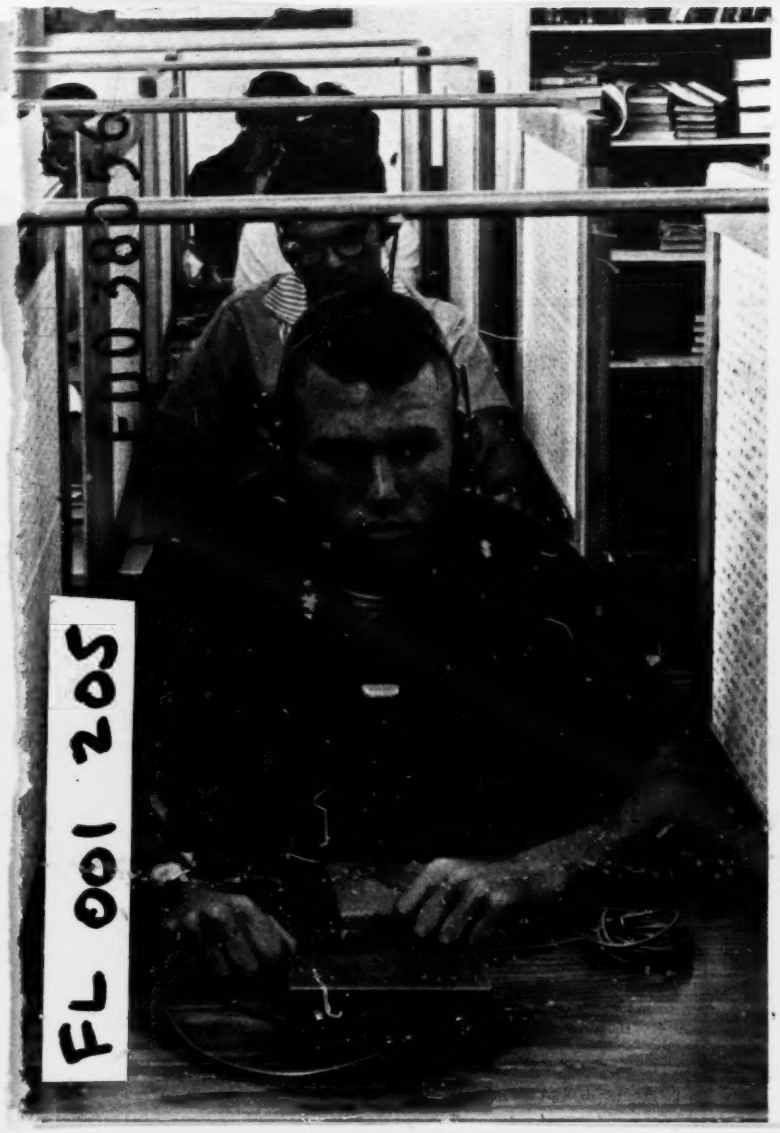
ABSTRACT

Language laboratory effectiveness in secondary schools and related research are discussed. Criteria for five elements determining the laboratory's effectiveness are described: (1) the teacher, (2) the teaching materials, (3) the testing and grading programs, (4) the student practice sessions, and (5) the equipment. Some general remarks are made about language laboratory research, and brief descriptions of 10 studies are offered. (AF)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THE LANGUAGE LABORATORY...

How Effective Is It?

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THE LANGUAGE LABORATORY . . . How Effective Is It?

by

Joseph C. Hutchinson

THE NUMBER of language laboratories in the secondary schools has grown dramatically over the past 5 years—from a few dozen to well over 6,000. These installations, which are of many types and sizes, represent an outlay of approximately $30 million.

How effective has this educational innovation been? There is still some evidence, despite the tremendous improvements schools have recently made in the teaching of modern foreign languages with the aid of the language laboratory, that in some quarters the laboratory is being misused and its function misunderstood. But this is not surprising: every new teaching aid goes through a period when some users persist in grasping it as the final solution to their teaching problems and in trying to use it for purposes for which it was never intended and in ways for which it is unsuited. Every new teaching tool undergoes a probationary period in which educators experiment with it to discover its potentialities, to define the objectives it can help them to achieve, and to find the most productive methods of using it. For most schools the language laboratory is still in this early period: we have barely

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scratched the surface of its potentiality, and we cannot yet make a definitive evaluation of its effectiveness. All that we can do at this time is to make a tentative evaluation on the basis of our experience so far.

What Makes for Effectiveness?

Like any tool or instrument, the language laboratory is most useful in the hands of a craftsman who knows how to use it skillfully. As every good teacher of a modern foreign language knows, the effective use of the language laboratory is a composite of the effectiveness of at least five elements: (1) The teacher, (2) the teaching materials, (3) the testing and grading programs, (4) the student practice sessions, and (5) the equipment. Each of these elements must meet certain criteria if the language laboratory is to produce the results expected of it.

First, the teacher must be interested in getting the most out of the equipment and materials; and he must have some skill in the effective use of these aids in helping students develop the skills of listening and speaking with comprehension.

A good teacher can make up for deficiencies in equipment and materials, just as an uninterested and unskilled teacher can negate whatever value students might obtain from even the finest of equipment and materials. But teachers today are caught between the pressures of a transitional period; and however skillful and dedicated they may be, in practice they lag behind the recent developments in methodological theory and instructional technology. This is why good inservice preparation of the teacher is an indispensable part of any school's plans for a language laboratory, and why most State departments of education employ, with the

aid of Federal funds under title III of the National Defense Education Act, foreign language supervisors to provide consultive services to local schools, including help with inservice programs (the Modern Language Association, through its foreign language program, also provides a free consultant service to help fill the gaps that remain in some States).

Thousands of foreign language teachers have been trained in summer institutes supported under NDEA, but thousands more have not yet received such training. Even for those teachers who have come under its influence, the gigantic effort of the institutes has not been great enough to enable them to catch up with changes in methods, materials, and equipment and at the same time improve their functional command of the language. Over 12,000 highly selected secondary school teachers, while they were attending the NDEA institutes, were given the Modern Language Association's Proficiency Tests for Teachers and Advanced Students; and the results show that a majority of these teachers, at the time they took the test, did not have enough oral proficiency in the foreign language to serve as models for their pupils. This evidence has been supported by reports from teams of foreign language educators who have visited the institutes.

But the teacher's qualifications cannot be considered in isolation from the circumstances around him. Careful planning by administrators and teachers together is an essential part of the introduction of language laboratory facilities into any school program. In the planning, the specific language program should surely have as much weight as administrative and budgetary considerations. In other words, the idea behind the

language laboratory—the idea of *substance*—is more important by far than the facilities themselves, which are *form* only. In its broadest sense, the language laboratory concept means regular and frequent use of recorded materials specially prepared as an integral part of a program in which audio-lingual instruction forms the basis for the progressive and continuous development of all the language skills.

Close cooperation and understanding between administrative and teaching staffs are essential not only in the planning for language laboratories but also in the use of them. Administrative decisions can easily mean the difference between an effective and an ineffective program, especially when such decisions preempt pedagogical decisions and ignore the specific needs of teachers and students. Therefore, the readiness of the school and the teachers is a prime factor in the successful use of any kind of language laboratory facilities.

Second, the teaching materials must be designed not only to develop the listening and speaking skills efficiently but also to integrate class and laboratory work.

Until recently, foreign language materials specifically designed for use in both class and laboratory in the secondary schools were not widely available. Materials for level I (usually the first year) began to appear on the market in 1961 and for level II in 1962. Materials for level III are just now appearing, and those for level IV are still being developed. This major problem—the problem of preparing good materials fast enough to meet the changing demands—is aggravated by the additional time it takes, sometimes years, for many school systems to adopt the new materials.

To use the new materials, experience has already shown us, the teacher needs new skills and new insight. Many teachers learn during a summer institute how to teach the first semester or the first year of an elementary course, but for lack of complete understanding and further experience they are unable to extend these techniques into higher levels. Some teachers have not yet learned what to do beyond taking the students through the first steps of imitation and memorization of dialogue material; a larger number do not yet know how to make the transition to effective structural drills; and a still larger number do not know how to make the transition to the creative use of the spoken language, that is, to have students recombine in new situations the dialogue and drill material they have already mastered. Very few teachers, we realize, give their students enough practice in listening before they plunge them into imitation of models.

Some foreign language teachers who are teaching their native language believe that the laboratory is useful only for teachers who are not fluent; consequently some fine teachers have resisted using a language laboratory. They seem to forget that the laboratory is primarily for the student, not for the teacher. The student needs it to intensify and individualize his practice of the spoken language as it has been modeled for him by a variety of native speakers—experience which no single teacher, no matter how proficient, can give him. By letting other voices take over the presentation of practice material, the teacher actually gains time for individualized teaching. The tape recorder can be an *aide* as well as an *aid*. One experienced teacher recently wrote that she could not get along without her language laboratory any more than she could without her blackboard.

Third, the testing and grading program must give due weight to achievement in listening and speaking.

A grave problem, which until now has hampered research on the effectiveness of the language laboratory, has been the lack of adequate instruments for measuring the listening and speaking skills. But this lack is now being corrected by the development of the Modern Language Association's Cooperative Classroom Achievement Tests. Early in 1964, for the first time in history, a set of standardized foreign-language achievement tests, which include tests for measuring the listening and speaking skills, will be available to the secondary schools; they will be available from the Educational Testing Service. The use of these tests should help solve many of the problems that result from use of traditional tests, which place at a disadvantage those students who have learned a language primarily through listening and speaking.

Fourth, the practice sessions must be frequent enough and long enough to enable students to develop the skills of listening and speaking.

The successful language laboratory program provides the student with the practice sessions he needs for developing his skills. Schools are gradually realizing the importance of regular and frequent practice and are adjusting their programs accordingly; and many schools, to minimize the problems of scheduling practice periods, have installed simplified language laboratory equipment in each foreign-language classroom, so that practice sessions can be held at any time during any class period.

A 1961–62 study of 133 secondary schools in New Jersey showed that over 50 percent of the schools scheduled practice sessions in

the language laboratory only once a week. The 1961–62 data that Raymond F. Keating of Teachers College gathered from 21 school systems of the Metropolitan School Study Council indicate that the average student used the language laboratory for practice only one period per week. But data received by the Office of Education for 1962–63 from 9 States representing 866 secondary schools in all sections of the country show the following numbers of practice periods scheduled in the language laboratory for each student: 3 to 5 a week in 37 percent of the schools, 2 a week in 36 percent, and 1 a week in only 27 percent. A 1962–63 study in 10 New York City high schools documents the dramatic gains made by students who had *daily* language laboratory practice in contrast to the lack of gains made by students who had only one practice session weekly.

Fifth, the equipment must be good enough and flexible enough to permit efficient operation on a regular basis.

Persons interested in learning about the importance of quality in language laboratory equipment and its relation to teaching and learning will find a detailed treatment of the subject in Alfred S. Hayes' *A Technical Guide for the Selection, Purchase, Use, and Maintenance of Language Laboratory Facilities.* (This publication is HEW Bulletin 1963 No. 37, OE–21024, and can be purchased for 50 cents from the Government Printing Office.)

Research: A General Statement

The problems of conducting research on teaching foreign languages in schools are

many. The schools lack qualified staff and find it diffcult to meet the administrative requirements for controlled teaching experiments; and most of the research and development in the use of language laboratories has been done in colleges and universities. According to John B. Carroll of Harvard University, most research studies on foreign-language teaching are not well designed and do not have adequate controls.

(Anyone seriously interested in research on foreign language teaching and on language laboratories should consult Dr. Carroll's chapter in *The Handbook of Research on Teaching* (a project of the American Educational Research Association), N. L. Gage, ed., Chicago, Rand McNally, 1963, and also *Research on Language Teaching: An Annotated International Bibliography for 1945–61*, by Nostrand and others, Seattle, University of Washington Press, 1962.)

Most of these studies point up the need for further research; much of the research establishes the worth of a particular program in a particular setting and is not necessarily applicable to another program in another setting. Responsible researchers usually caution readers against applying their conclusions indiscriminately and against misinterpreting the meaning of the findings. Dr. Carroll, for example, reported on a small experiment in which the obvious implications were not what he considered the true ones. The experiment compared two high school classes, one with a language laboratory and one without. Both groups did about as well in auditory comprehension, but the laboratory group did less well in standard tests on reading, vocabulary, and grammar. In these results Dr. Carroll found no reason to doubt the utility of the language laboratory—only evidence of the need to improve instruction in the laboratory.

There are those who hold that the usefulness of the language laboratory has already been established beyond doubt. Fred M. Hechinger, writing in the *New York Times*, May 19, 1963, said, "If the ability to speak a language is to be a first priority in foreign language study—and all but the most unreconstructed translation-minded educators today agree with this goal—then the usefulness of the language laboratory is self-evident." Many researchers question the need for further documentation of the usefulness of the language laboratory, as compared to the no-language-laboratory. Certain well-established principles underlying the learning of motor skills support the basic idea of the language laboratory. Some researchers also think that the contributions of machines to students' learning, whether these machines are teaching machines or language laboratories, do not constitute a single isolable variable, especially since the program itself is so much more important than the vehicle by which it is presented.

But as Carroll and Nostrand both point out, there are many aspects of foreign language learning related to the use of language laboratories that do need further research.

Let us hope that administrators and teachers will continue to be interested in research on the teaching and learning of foreign languages and on the use of language laboratory facilities, and that those with the proper resources will themselves try a variety of experiments. Now that better testing instruments for all four skills are available, much more valid results can be obtained. Let us hope, too, that teachers and administrators will make a practice of going to the primary sources of information: studying any piece of research thoroughly, especially when important decisions are to be based on

it, is more important than accepting reports on the research as the final word.

Research: Some Specific Studies

From several studies pertinent to our principal question—how effective is the language laboratory?—I have selected some of the findings for presentation here, to indicate the kind of useful clarification that research has provided on various aspects of utilizing the language laboratory.

★ In his master's thesis at the University of Maryland, Billy Smith presents the results of a questionnaire sent to secondary school foreign language teachers using language laboratories. Judging by the replies—from 245 teachers in 14 States—there is still considerable lag between theory and practice in the use of audiolingual procedures and language laboratory facilities.

Mr. Smith finds that teachers still are not consistent in their use of new methods and materials, that they lack training, experience, and confidence in the language and in coordinating work in the laboratory with work in the classroom. Many teachers believe that a prereading phase of instruction is too demanding, and they feel more secure if they rely on early use of written materials and on older, more familiar methods. Yet 63 percent of the respondents said that they were using the "audiolingual method" (described in the questionnaire as "memorization of basic material, such as dialogues, followed by oral drill designed to provide practice in managing common grammatical constructions"). Strangely enough, as many as 10 percent of these teachers were using tapes which do not provide for immediate correction of student responses. The findings in this study are symptomatic of the transi-

tional era through which we are passing—an era which may continue for several more years.

★ Two recent studies shed some light on a few of the variables resulting from the type of equipment used in the laboratory and the kind of practice schedules followed. Although the methods, materials, and tests used in these studies were apparently "transitional," the results do indicate that certain combinations of laboratory practice, both in kind and in frequency, can be more productive than others.

The first of these studies concerned the relative effectiveness of four different kinds of laboratory practice for 523 second-year French students in 10 New York City high schools. Half of the experimental groups had practice sessions in the laboratory every day; the other half, only once a week. Half of the groups in each half used audioactive

Laboratory equipment properly used is to the language student what the practice piano is to the piano student—the instrument on which the student can practice and practice until he acquires the skill he needs.

equipment exclusively; the rest used recording-playback equipment. The control groups used no electronic equipment at all.

The results indicate that the students who had only one laboratory practice period a week made no more gains than those in the control groups; in one school the control group even made greater gains than the once-a-week group. Students who had daily practice, however, made dramatic gains (a study in the same schools a year earlier showed that positive results could be achieved with two laboratory periods a week). In listening and speaking skills, the daily recording-playback group showed more striking gains than the daily audioactive group; and in overall gains the daily laboratory groups were superior to the no-equipment groups.

The second experiment was made with 4 groups of students in first-year French—30 students in each group—in the Easton Area High School, Easton, Pa. Each group spent one-fourth of its daily class period in laboratory practice, but each group used a different type or combination of equipment. The group using audioactive-record equipment exclusively excelled only in pronunciation; but the group using audioactive equipment for 80 percent of the practice time and audioactive-record equipment for the rest gave the best performance in listening and speaking.

★ A study of the relative effectiveness of four basic systems of laboratory equipment has been conducted at Colgate University with Federal support under title VI of the National Defense Education Act. It was a closely controlled psychological laboratory experiment designed to explore a number of variables in the teaching of a single linguistic element—French pronunciation—with electronic devices, in the hope of getting infor-

mation that would be useful in further research in a teaching situation.

The four basic systems were (1) headphones only, (2) audioactive headphone-microphone, (3) record-playback (long-delay playback, not audioactive), and (4) short-delay playback, which gave the sound back to the student after each utterance. A fifth system, which combines record-playback and audioactive headset, unfortunately was not tested; this type has always been standard in commercial language laboratory equipment.

The results of the study suggest that for improvement of pronunciation the audioactive headphone-microphone is probably superior to unactivated headphones; and that differences among the four systems are not necessarily significant, at least not in the extent to which they help students learn to imitate spoken language. Effective as each type showed itself to be in helping the student learn, none showed itself so important as the classroom instructor who is a perceptive observer of his students. The contribution the instructor makes in reinforcing the student's self-correction and practice is indispensable.

Results in the Colgate experiment also suggest that even minor deficiencies in the quality of the sound produced by the laboratory equipment can hamper the student's progress. Similar conclusions have been reached at the Massachusetts Institute of Technology: an experiment there showed that as the frequency response of equipment was reduced, beginning students in French and German were less able to distinguish and repeat syllables. The French students were perceptibly less able to do so; the German students, markedly less. These findings, as well as those in New York City and Easton,

Pa., seem to support the idea that the type of equipment is perhaps not nearly so important as the quality of the equipment, materials, and techniques used in the teaching.

★ Joseph R. Reichard at Oberlin College in 1960–61 conducted an experiment with a first-year German program in which practice in the laboratory was closely integrated with work in the classroom. According to Professor Reichard's report, the project has produced evidence that one teacher can teach twice as many students as he formerly did and not impair the quality of the students' accomplishment.

Each week the experimental class, which contained 50 students, spent 3 hours in the classroom with an instructor and 3 hours in laboratory practice under the supervision of an undergraduate assistant. Sessions in the classroom alternated with sessions in the laboratory. Eclecticism prevailed in the instructor's choice of materials and methods, in contradistinction to the more traditional materials and methods used with the control classes.

The control classes contained 25 to 30 students each, met 5 hours a week in regular class sessions with regular instructors, and spent no time with electro-mechanical aids.

Results in all classes were measured by reading and listening tests from the College Entrance Examination Board. To broaden the basis of comparison, the CEEB tests were given also to first-year German classes at Harvard and Princeton. On both the reading and the listening tests, the Oberlin experimental group performed significantly better than either the control classes or the Harvard and Princeton groups. Oberlin now has adopted an alternating-class-and-laboratory pattern for its first-year German courses.

★ Eric Bauer in his master's thesis at DePauw University presents the results of an experiment comparing the achievement in two German classes, one taught in a program that integrated classroom and laboratory work and the other taught without a laboratory. Students in the control group spent 30 percent more time than the experimental group in studying, yet in 5-part tests the experimental group showed 40 percent more improvement in pronunciation and 30 percent more gain in lexical knowledge. In tests 6 months later the experimental group showed that they had retained more of everything; their pronunciation was 50 percent better. Both underachievers and medium achievers made more progress in the experimental group than those in the control did.

In 1960–61 Mr. Bauer, now at Notre Dame, conducted a study to determine which of two sets of laboratory conditions—those controlled by the individual or those controlled for the group—would be more helpful to college students in second-year German. Results of both oral and written tests indicate the advantages of instructional supervision in laboratory sessions, especially during the first 6 weeks of the semester.

★ Evidence that language laboratories and the audiolingual approach have not yet had an opportunity to prove themselves is presented in a report by Joseph Axelrod and Donald N. Bigelow, who with others in the fall of 1960 visited 46 university language and area centers (these centers are highly specialized programs for teaching the "neglected" languages to persons who will be using these languages—college professors, for example, and representatives of government and industry).

Among other things, the authors reported on the extent to which the centers were using

language laboratories and the audiolingual approach; they rated each center, on a 1-to-5 scale (1 for low, 5 for high), on its commitment to the audiolingual approach and, on a 1-to-4 scale, on its use of a laboratory as an integral part of its program. They found 23 centers ranking high, that is, 4 or 5, in their commitment to the audiolingual approach; the rest ranked from 1 to 3. Of the high-ranking centers, 11 integrated the laboratory into their programs, 7 used a laboratory but not as an integral part of their programs, and 5 had no laboratory at all. Of the centers ranking low in their commitment to the audiolingual approach, only 4 integrated the laboratory into their program, 9 did so to some extent, and 10 had no laboratory. Many of the centers have changed their programs and practices since these ratings were made, but the status of the programs at that time is symptomatic of the transition period through which all foreign language programs now are passing.

★ Both the Foreign Service Institute of the Department of State and the Army Language School of the Defense Language Institute, like many colleges and universities, have for many years experimented with various techniques and procedures; and the use they make of language laboratory facilities is based on their own findings, not merely on the experience of others. The fact that both of these schools use these facilities as an integral part of their intensive language courses, even though their classes rarely have more than 10 students and are always taught by native speakers, indicates that they consider regular and frequent practice indispensable to the student who is learning to speak a foreign language.

One recent small experiment in the Army Language School (the West Coast Branch of

the Defense Language Institute) compared two classes. Both received the same standard intensive training in class. In addition, the control group was given homework to do with recordings; and the experimental group, which was not given any written material or any homework, regularly used recorded course materials with audioactive laboratory equipment in the classroom. At the end of the experiment, the experimental group showed itself markedly superior to the control group in perception of sound and in pronunciation. In control of grammatical structures, however, the two groups did not differ significantly.

★ George A. C. Scherer and Michael Wertheimer recently completed, under title VI of NDEA, a 2-year experiment at the University of Colorado, on the teaching of German (their report is to be published in 1964 by McGraw-Hill: *A Psycholinguistic Experiment in Foreign Language Teaching*). Their purpose was to determine which groups of students after 2 years of instruction would have more skill in reading and writing—groups taught by an audiolingual approach or groups taught by a conventional grammar-and-reading approach. The researchers measured not only the four skills of listening, speaking, reading, and writing but also such related matters as aptitudes, attitudes, motivations, and assimilation of meaning. In all, 72 measures were computed and correlated in this ingenious experiment, which involved 10 instructors and well over 200 students.

Outside their regular class periods, students in the sections taught by the audiolingual approach practiced one-half hour a day in the language laboratory; students in the control sections studied without the aid of equipment. So that the students in the

laboratory would have the same amount of teacher contact time, no tutorial assistance was provided in the laboratory. (This version of audiolingual teaching, in which classroom work is supplemented by nonmonitored library-type work in the laboratory, is usually possible only in colleges and universities. Few high schools can accommodate this kind of practice session in the laboratory outside the regular class period.)

The major results of the Colorado experiment include these: In listening, the audiolingual students were far superior to the traditional students at the end of the first year, but this difference disappeared by the end of the second. In speaking, the audiolingual students were far superior at the end of the first year and maintained their superiority throughout the second. In reading, the traditional students were better than the audiolingual students at the end of the first year, but the difference disappeared during the second year. In writing, the traditional students were better at the end of the first year and maintained their superiority during the second year. In translating from German to English, the traditional groups were also superior in both years; but in translating from English to German, the superiority they showed in the first year disappeared by the end of the second. A combination proficiency score on all six skills at the end of each of the four semesters showed no significant differences between the two groups. Other measures showed the experimental groups to be superior in assimilating the meaning of sentences and in associating German symbols with their meanings; they also had more desirable attitudes toward Germans and the speaking of German.

★ Long-range studies on the use of language laboratories are being conducted at

such universities as Michigan, Indiana, and Tulane. The final conclusions should be forthcoming in the next year or two, but preliminary reports already indicate that the laboratory does indeed help the student to learn a foreign language more efficiently. In fact, Albert Valdman's research at Indiana on the teaching of French is already producing evidence that when students learn units of special programed materials in the laboratory and work regularly with an instructor in small groups in "display" sessions, virtually all of the routine teaching of the language can be turned over to the laboratory. Preliminary results indicate that students in laboratory classes have a higher retention rate than students in conventional classes and a much greater oral proficiency though their reading ability is less.

The Tulane study has produced evidence that a standard audiolingual and laboratory approach can be effective in a liberal arts foreign language curriculum, one that does not neglect reading, writing, and the study of literature. One unusual result reported from that study is that the students transfer to reading the skills they learned in an initial period of audiolingual and language laboratory training.

THROUGH RESEARCH like this in colleges and universities and through practice and trial in the schools, the usefulness of the language laboratory has been validated over and over again, and is constantly being validated now—in situations where both the teachers and administrators recognize the potentialities of the laboratory and plan together to find the best ways of integrating the new methods into the total foreign lan-

guage curriculum. If in some places the language laboratory is still considered a fad or a status symbol, lack of careful and cooperative planning by administrators and teachers is probably to blame.

For at least 15 years the materials, methods, and procedures needed for effective use of the language laboratory have been evolving. For levels I and II they are now well developed, but there is still a great need for well-trained teachers and for enough facilities to give first- and second-year language students the practice time they need. For more advanced courses—levels III and IV and beyond—much progress also has been made in the development of materials and procedures, but before the nationwide situation can be called anywhere near satisfactory, we will have to expend much more time and pioneering effort.

All during the time when most secondary schools have struggled to adapt to changes and to meet the demands placed upon them, college and university professors have played an uneven role: they have shown themselves both enlightened and uninformed; some have been trail blazers while others have put up obstacles to change. What the situation is today in foreign language education at all levels is placed in perspective in *Curricular Change in the Foreign Languages*, published last fall by the College Entrance Examination Board.

The famous American know-how that produced the language laboratory is unfortunately not present in all school systems to receive the laboratory when it arrives. Teachers need to be taught how to use the new equipment and the new materials; but many States, though they have approved purchases of equipment and materials with the aid of Federal funds provided under title

III of the National Defense Education Act, have been less eager to use funds available under the same title to provide inservice programs for the teachers.

Despite the problems and the handicaps, however, schools and colleges both in this country and abroad have made tremendous strides toward the fully effective use of equipment and materials in foreign language classrooms. We already know that the language laboratory can be effective; what remains to be seen is how long it will take for schools not only to acquire adequate laboratory facilities but to learn how to use them.

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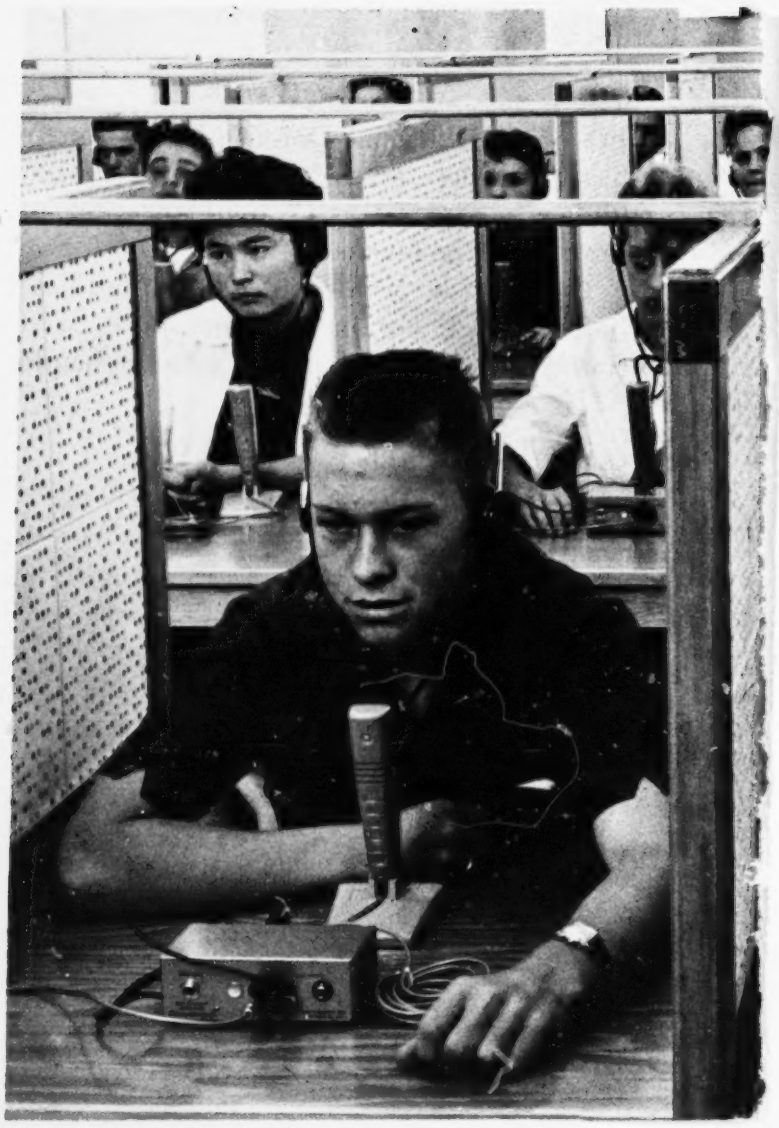

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